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of the wood has long been known, its liability to 'winter-kill' and its irregular, crooked growth has prevented its being planted for timber."

Much space is also given in this report to the subject of Fungi on living plants, which are more disastrous to crops than the ravages of insects. These forms include rusts, smuts, mildews, rots, blights, etc., the rust alone on wheat taking from the former more than all the tax collectors, and creating such losses as to frighten cultivators from their business. Professor Burrill regrets that the study of Fungi receives so little attention in this country, and says the number of American botanists who have published original accounts of the development of any fungous species may be counted on the fingers of one hand. As much practical importance and scientific interest is attached to such a study, we trust many botanists may in the future give more of their time to original investigations in this direction.

### MICROSCOPY.

*The American Monthly Microscopical Journal* for October, describes a warm stage for the Microscope, by Professor E. H. Bartley. It has the advantage of being so simple that it can be constructed at home with a few inexpensive materials. We once saw this apparatus shown by the inventor at the New York Microscopical Society, and considered it a success.

Simple forms of mechanical figures are described by Mr. J. Sullivant.

Professor C. C. Merriman's interesting paper on the microscopical collections made by him in Florida, occupies nine pages of this number.

We regret that Mr. Frederick Habirshaw's "*Catalogue of the Diatomaceæ*" will be delayed in the publication for the want of sufficient promise of patronage. This may arise from many not understanding the nature of the work or its construction. If the editor of the *American Monthly Microscopical Journal*, who has the matter in hand, would print a sample page in his journal, it might remove such a difficulty. We believe we have heard the author himself state that the book in question would be useless to those not having a full library of works on the subject, so as to avail themselves of the ample references he makes to the published literature of the subject.

The demand for such a work must be very limited; on the other hand a condensation of all this literature would be very welcome. A comprehensive work on the diatomaceæ, well illustrated, is much wanted and if issued in monthly parts, at a moderate price, would command a fair sale both at home and abroad.

Mr. Habirshaw appears to have the material for such a work in his possession, and he has given ample proof of his literary ability to undertake the task.

We think ten dollars would be better invested in a work such as we suggest, than five dollars in an index to a scattered literature, which the purchaser can never hope to possess.

### PHYSICAL NOTES.

**OBSERVATION MADE ON A GROUP OF RAYS IN THE SOLAR SPECTRUM.**—L. Thollon figures and describes a group of four rays, situate in the Orange. Two of these rays belong to Iron, their wave-lengths being respectively 5976.1 and 5974.6. The other two are Telluric, and their wave-lengths are 5976.35 and 5974.36.

**CAUSE OF THE VARIATIONS OF THE FIXED POINTS OF THERMOMETERS.**—J. M. Crafts cites some experiments which reduce to nothing, or almost so, the part played by pressure in the permanent elevation of the zero-point. The glass blown at the lamp and exposed for a long time to the action of heat diminishes in volume by means of

some internal change, and it is not demonstrated that pressure plays any part whatever in the phenomenon. The particles of glass which have been removed asunder whilst it was being blown do not return immediately to their normal position at a lower temperature; we observe disturbances for some time, and finally the glass may remain for a long time in a state of tension at the ordinary temperature. The action of heat at a given temperature (e.g., 355°), giving a greater mobility to the particles, favors their return to the normal position, and gives scope to a contraction. But the glass, when cooling from this latter temperature retains a part of the displacement peculiar to 355°. On heating again to a lower temperature (e.g., 300°) a new decrease of volume is produced, so that a very slow cooling, which produces successively all these effects upon the particles of glass, must ensure the greatest stability.

**RAPID ALCOHOLIC FERMENTATION.**—In order to effect rapid fermentation for the destruction of the sugar contained in wines, J. Bouissngault suggests that the sample be mixed with water and yeast, and placed in connection with an exhausting syringe, reduces the pressure, and thus which eliminates the alcohol as fast as formed. The fermentation, not being checked by its presence, goes on till all the sugar is decomposed.

**INCONVENIENCES, FROM A PHYSIOLOGICAL POINT OF VIEW, OF THE SUBSTITUTION OF AMYLIC ALCOHOL FOR ETHER IN STAS'S PROCESS FOR THE DETECTION OF MORPHINE.**—As amylic alcohol, even in very small doses, produces in animals systems closely resembling narcotism, and as it is not readily removed from the cadaveric extract, physiological experimentation in confirmation of the chemical reactions of morphine is rendered untrustworthy.—*Comptes Rendus*.

**INFLUENCE OF THE GALVANIC CURRENT ON BACTERIA.** F. Cohn and B. Mendelsohn carried out their experiments to verify the assertion of Schiel, that the galvanic current prevented the development of Bacteria. The results were that a feeble current from one pair of elements had no perceptible effect; a current from two elements rendered the solution inactive at the positive pole; a current from five, continued for twenty-four hours, completely sterilized the whole solution, and deprived it of its power to infect another solution. The solution at the positive pole was first affected; with the stronger current the liquid became acid at the positive and alkaline at the negative pole. The induction current had no perceptible effect on the Bacteria.—*Four. Chem. Soc.*

**EFFECT OF AGE ON THE QUALITY OF IRON.**—Previous tests have shown that iron, subject to even fifty years of use and exposure, is not perceptibly changed in quality, either in strength or elasticity. Professor Thurston recently tested the remains of the Fairmount Suspension Bridge, which had been in use forty years, and found the iron in no manner deteriorated.

**PHOSPHORESCENT LIGHTING.**—Dr. Phipson takes Sulphide of Barium, or some other substance which is rendered phosphorescent by the solar rays, and encloses it in a Geissler tube, through which he passes a constant electric current of a feeble but regular intensity. He claims to obtain in this manner a uniform and agreeable light, at a lower cost than that of gas.

### BOOKS RECEIVED.

**SUGAR ANALYSIS—A DESCRIPTION OF THE METHODS USED IN ESTIMATING THE CONSTITUENTS.** By M. Benjamin, Ph. B. New York. 1880.

To those who desire a concise and practical guide to this subject, Dr. Benjamin's essay, published in pamphlet form with twenty illustrations, will perhaps be more serviceable than a more elaborate work. The essential facts for a general comprehension of the subject have been judiciously arranged.